UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.

EXAMINER	

ART UNIT	PAPER NUMBER
	12

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
08/721,259	Rupar et al.
Examiner	**Group Art Unit**
Rebecca Prouty	1814

☐ Responsive to communication(s) filed on _____.

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *1-70* is/are pending in the application.

Of the above, claim(s) *6-44, 47-49, and 57-62* is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *1, 3-5, 45, 46, 50-56, and 63-69* is/are rejected.

☒ Claim(s) *2 and 70* is/are objected to.

☒ Claims *1-70* are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

DOCKETED ☐ UPDATED ☐

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-5, 45, 46, 50-56 and 63-70, drawn to CryET29 proteins, compositions and methods of use, classified in class 514, subclass 12.

II. Claims 6-44, drawn to CryET29 genes, vectors, hosts cells and expression thereof, classified in class 435, subclass 69.1.

III. Claims 47-49, drawn to CryET29 antibodies and methods of use, classified in class 530, subclass 387.9.

IV. Claims 57-62, drawn to transgenic plants, classified in class 800, subclass 205.

The inventions are distinct, each from the other because of the following reasons:

Inventions I-V are drawn to patentably distinct products that would require separate literature searches. Group I is drawn to CryET29 proteins, Group II is drawn to DNA molecules encoding CryET29, Group III is drawn to CryET29 antibodies and Group IV is drawn to a recombinant plant. Each product is structurally different. The DNA has other utility besides encoding the proteins such as a hybridization probe and the proteins can be made by another method such as isolation from natural sources or chemical synthesis. The proteins of Group I have other utility

besides acting as an antigen to induce the antibodies of Group III, such as an insecticide. The search for transformed cells such as those of Group II and transformed plants such as those of Group IV requires the consideration of different issues i.e., separate transformation and culture techniques for plants and cells and is not coextensive as they are separately classified as noted above.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Barbara Kitchell on 3/11/97 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-5, 45, 46, 50-56 and 63-70. Affirmation of this election must be made by applicant in responding to this Office action. Claims 6-44, 47-49 and 57-62 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a diligently-filed petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(h).

Claim 70 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. See MPEP § 608.01(n). Accordingly, the claim has not been further treated on the merits.

35 U.S.C. § 101 reads as follows:

> "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title".

Claims 45, 46, and 63-65 are rejected under 35 U.S.C. § 101 because the claimed invention is directed toward non-statutory subject matter. In the absence of the hand of man, naturally occurring proteins and bacteria are considered non-statutory subject matter. Diamond v. Chakrabarty, 206 USPQ 193 (1980).

This rejection may be overcome by amending the claims to contain wording such as "A composition comprising an isolated and purified CryET29 protein ..." or "A biologically pure culture of *Bacillus thuringiensis* cells ....

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification is objected to under 35 U.S.C. 112, first paragraph, as failing to provide an adequate written description and failing to provide an enabling disclosure.

The invention appears to employ novel organisms, i.e., *Bacillus thuringiensis* EG4096, (NRRL B-21582), EG11494 (NRRL B-21583), and EG11502. Since the organisms are essential to the claimed invention, they must be obtainable by a repeatable method set forth in the specification or otherwise be readily available to the public. The claimed organisms are not fully disclosed, nor have they been shown to be publicly known and freely available. The enablement requirements of 35 U.S.C. § 112 may be

satisfied by a deposit of the organisms. The specification does not disclose a repeatable process to obtain the organisms and it is not apparent if the organisms are readily available to the public. Accordingly, it is deemed that a deposit of this organism should have been made in accordance with 37 CFR 1.801-1.809.

It is noted that applicants have deposited some of the organisms but there is no indication in the specification as to public availability. If the deposit was made under the terms of the Budapest Treaty, then an affidavit or declaration by applicants, or a statement by an attorney of record over his or her signature and registration number, stating that the specific strain has been deposited under the Budapest Treaty and that the strain will be irrevocably and without restriction or condition released to the public upon the issuance of the patent, would satisfy the deposit requirement made herein.

If the deposit has not been made under the Budapest treaty, then in order to certify that the deposit meets the criteria set forth in 37 CFR 1.801-1.809, applicants may provide assurance or compliance by an affidavit or declaration, or by a statement by

an attorney of record over his or her signature and registration number, showing that:

1. during the pendency of this application , access to the invention will be afforded to the Commissioner upon request;

2. all restrictions upon availability to the public will be irrevocably removed upon granting of the patent;

3. the deposit will be maintained in a public repository for a period of 30 years or 5 years after the last request or for the effective life of the patent, whichever is longer; and

4. the deposit will be replaced if it should ever become inviable.

Claims 3, 64, 65, and 67-69 are rejected under 35 U.S.C. § 112, first paragraph, for the reasons set forth in the objection to the specification.

Claims 1, 3-5, 45, 46, 50-56, 63, and 66-69 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 56 is confusing as it recites a kit including a pharmaceutically acceptable formulation of a composition

comprising a CryET29 protein or fragment thereof wherein the pharmaceutically acceptable composition is further defined as comprising a purified CryET29 protein or a recombinant host cell expressing said CryET29 protein. This is confusing as a recombinant host cell is not within the scope of the composition defined in the independent claim, i.e., a recombinant host cell expressing a CryET29 protein is not a composition comprising a CryET29 protein.

Claims 1, 3-5, 45, 46, 50-56, 63, and 66-69 are confusing as it is unclear what the scope of the term "CryET29 crystal protein" is. The specification discloses a single protein of SEQ ID NO: 2 which is clearly intended to be within the scope of this term. However, it is unclear what additional properties a protein which differs from that of SEQ ID NO: 2 in one or more amino acids must have to be included within the scope of this term. If the term is interpreted to include only the protein of SEQ ID NO: 2, all of claims 1-3 and 5 are identical in scope. As such this is assumed not to be applicants intent. To the extent that this term includes proteins with amino acid sequences different from SEQ ID NO: 2, the following rejection applies:

Claims 1, 3-5, 45, 46, 50-56, 63, and 66-69 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the protein of SEQ ID NO:2, compositions thereof and methods of use thereof, does not reasonably provide enablement for other CryET29 proteins, compositions thereof and methods of use thereof. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

As discussed above the term CryET29 crystal protein is presumed to include variants of the protein of SEQ ID NO: 2. The scope of the claims is not commensurate with the enablement provided by the disclosure with regard to the extremely large number of toxins broadly encompassed by the claims. Since the amino acid sequence of a protein determines its structural and functional properties, predictability of which changes can be tolerated in a protein's amino acid sequence and obtain the desired activity requires a knowledge of and guidance with regard to which amino acids in the protein's sequence, if any, are tolerant of modification and which are conserved (i.e.,

expectedly intolerant to modification), and detailed knowledge of the ways in which the protein's structure relates to its function. However, in the case of the toxins of *Bacillus thuringiensis*, while many have been sequenced it is well known that even very minor changes in sequence may affect the insecticidal activity of the protein. Furthermore, little, if any, predictability is exhibited in the effects of these changes.

While recombinant and mutagenesis techniques are known, it is not routine in the art to screen for multiple substitutions or multiple modifications, as encompassed by the instant claims, and the positions within a protein's sequence where amino acid modifications can be made with a reasonable expectation of success in obtaining the desired activity/utility are limited in any protein and the result of such modifications is unpredictable. In addition, one skilled in the art would expect any tolerance to modification for a given protein to diminish with each further and additional modification, e.g. multiple substitutions.

The specification does not support the broad scope of the claims which encompass an enormous number of variants of the toxin of SEQ ID NO: 2 because the specification does **not** establish: (A) regions of the protein structure which may be modified without affecting insecticidal activity; (B) a rational and predictable scheme for modifying the toxin residues with an expectation of obtaining the desired insecticidal activity; and (C) the specification provides insufficient guidance as to which of the essentially infinite possible choices is likely to be successful.

Thus, applicants have not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims broadly including an enormous number of variants of the toxins of SEQ ID NO: 2. The scope of the claims must bear a reasonable correlation with the scope of enablement (In re Fisher, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of mutant toxins having the desired insecticidal characteristics is unpredictable and the experimentation left to those skilled in the art is

unnecessarily, and improperly, extensive and undue. See In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rebecca Prouty, Ph.D. whose telephone number is (703) 308-4000. The examiner can normally be reached on Monday-Friday from 8:30 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Wax, can be reached on (703) 308-4216. The fax phone number for this Group is (703) 305-7401.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0196.

Rebecca Prouty
Patent Examiner
Art Unit 1814